TITLE

"LADDER STABILISER"

FIELD OF THE INVENTION

This invention relates to a ladder stabiliser for stabilising a ladder.

BACKGROUND OF THE INVENTION

The use of ladders on a level, firm surface by an individual is typically quite safe. Feet, usually found on most modern ladders, are sufficient to keep the ladder in position when a person is climbing a ladder on a flat surface.

However, difficulties often arise when the surface is inclined and/or soft. A person who climbs a ladder frequently causes the stability of the ladder to be compromised causing the ladder and the person using the ladder to fall. Therefore, on an inclined or soft surface, a second person has been required to hold the ladder.

To overcome the need for a second person, ladder stabilisers have been developed to assist in preventing the ladder from falling when in use. One such ladder stabiliser is shown in European Patent Application No. 172 284. This ladder stabiliser works well in most situations as the leg of the stabiliser can be adjusted relative to the stile on the ladder to allow for differing incline surfaces.

However, the ladder stabiliser shown in European Patent Application No. 172 284 may not provide sufficient ladder stability when there are obstacles such as walls preventing the extension of the leg. In

this situation, the leg will provide little or no stability to the ladder. Further, the number of components that are used to manufacture the ladder stabiliser is large making the ladder stabiliser expensive to manufacture and difficult to attach to the ladder.

Similar ladder stabilisers have been disclosed in US Patent No. 5,551,529, US Patent No. 5,154,257, US Patent No. 4,807,720 Canadian Patent Application No 2,281,209 and International Publication No WO 02/059446. All of these ladder stabilisers have legs that are extendable. However, all these ladder stabilisers are expensive to manufacture, do not extend substantially laterally and/or are difficult to transport.

OBJECT OF THE INVENTION

It is an object of the invention to overcome or alleviate one or more of the above disadvantages or provide the consumer with a useful or commercial choice.

SUMMARY OF THE INVENTION

In one form, although not necessarily the only or broadest form, the invention resides in a ladder stabiliser for stabilizing a ladder comprising:

an arm member attachable to the ladder, the arm member including a body, a leg and a foot;

said leg being movable telescopically with respect to the body;

said foot being attached adjacent to an end of the leg and movable with respect to the leg; and

a brace attached to the arm member and attachable to the ladder;

wherein a pivot is attached to the end of the arm member to pivotally mount the ladder stabiliser to a ladder.

The arm member may be pivotally attached to the ladder using a hinge. The hinge may be attached adjacent an end of the body.

The leg may be located within the body. The leg may be fixed to the body once a desired location has been attained. A fastener such as a thumbscrew or spring biased pin may be used for this purpose.

The foot may be rotatably movable with respect to the leg. The foot may include a threaded shaft that rotates within a nut. The nut may be attached to a plate.

Alternatively, the foot may be pivotally attached to the end of the leg.

The brace may be attached to the body. The brace may be pivotally attached to the ladder. A tab forms part of the body to capture a pin located on the brace.

The brace may be telescopic to adjust the angle of the arm member with respect to the ladder.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention, by way of example only, will be described with reference to the accompanying drawings in which:

FIG. 1 is a front view of two ladder stabilisers attached to stiles of a ladder according to a first embodiment of the invention;

FIG. 2 is an exploded perspective view of the ladder stabiliser shown in FIG. 1.

FIG. 3 is a front view of two ladder stabilisers attached to stiles of a ladder according to a second embodiment of the invention;

FIG. 4 is an exploded perspective view of the ladder stabiliser shown in FIG. 1;

FIG. 5 is a side view of a hinge connecting the ladder stabiliser to the ladder;

FIG. 6 is a perspective view of a foot attached to a leg; and

FIG. 7 is a perspective view of an alternate brace.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1 and 2 show a ladder stabiliser 10 for use on a ladder 11. The ladder stabiliser 10 comprises an arm member 20 and a brace 30. The arm member 20 has a body 40, a leg 50 and a foot 60.

The body 40 is produced using a rectangular hollow channel 41. A threaded hole 42 is positioned adjacent a bottom end of the channel for location of a thumbscrew 43. A tab 44 is located on the side of the hollow channel 41 to allow the brace 30 to be attached to the body 40. A hinge 45 is attached to the top end of the channel 41 and is used to attach the body 40 to a stile 12 of the ladder 11. Rivets (not shown) are used to attach the hinge 45 to the stile 12 of the ladder.

The leg 50 is also formed from a rectangular hollow channel 51. The channel 51 is sized so that it fits with the channel 41 that forms the body 40. This allows the leg 50 to slide telescopically with the body 40.

A series of spaced threaded holes 52 are located along the length of the channel 51. The holes 52 are positioned so that when the leg 50 is slid with the body 40, the holes 52 of the leg 50 are aligned with hole 42 located on the body 40. The thumbscrew 43 is placed through the aligned holes 42,52 to hold the leg 50 securely with respect to the body 40.

The foot 60 includes a U-shaped plate 61 to which is attached a threaded nut 62. A threaded shaft 63 is located through the nut 62. A base 64 is attached to an end of the threaded shaft 63 and a rubber shoe 65 is attached to the base 64. Rotation of the shaft 63 causes the base to move closer to or further away from the U-shape plate 61 dependent upon the direction of rotation of the shaft 63. The foot 60 is attached to the leg by located screws 67 through holes 66,53 in the U-shape plate 61 and the leg.

The brace 30 is formed from a flat strip of metal 31. A pin 32 is located at one end of the brace to allow the pin to be located with the tab 44 of the body 40. The brace 30 is attached to a stile 12 of the ladder 11 using an appropriate fastener such as a screw, bolt or the like.

In use, the ladder stabiliser 10 is used in the following manner. Once the ladder 11 is located in its desired position, the pin 32

on the brace 30 is located through the tab 44. The thumbscrew 43 is then removed from the hole 43,52 and the leg 50 is extended from the body 40 until the foot hits the ground. If the hole 52 in the leg 50 and the hole 42 in the body 40 do not align when the foot touches the ground, the threaded shaft 63 is then rotated to extend or shorten the length of the arm member so that the holes 42,52 are aligned. The thumbscrew 43 is then replaced in the holes to secure the leg with respect to the body.

FIGS 3 and 4 show a further embodiment of a ladder stabiliser 110 attached to a ladder 111. The ladder stabiliser 110 again has an arm member 120 and a brace 130. The arm member 120 again has a body 140, a leg 150 and a foot 160.

The body 140 is produced using a hollow channel 141. A spring biased pin 142 is located within a hollow shaft 143 that extends upwardly from the body 141. The pin 142 is biased toward a position where the pin 142 extends into the hollow channel 141. A tab 144 is located on the side of the hollow channel 141 to allow the brace 130 to be attached to the body 40. A hinge 145 is attached to the top end of the hollow channel 141 and is used to attach the body 140 to a stile 112 of the ladder 11.

FIG 5 shows the hinge 145 in more detail. The hinge 145 includes a spigot 146 and a hinge pin 147. The spigot 146 is connected to a stile 112 of the ladder 111. The hinge pin 147 extends through the hollow channel 141 and the spigot 146 to allow rotation of the arm member 120 with respect to the ladder 111. A lock 148 passes through

the hinge pin 146 to prevent loss of the hinge pin 146. A chain 149, connected to the hollow channel 141 and the lock 148, assists in prevent the loss of the hinge pin 147.

The leg 150 is also formed from a rectangular hollow channel 151. The channel 151 is sized so that it fits with the channel 141 that forms the body 140. This allows the leg 150 to slide telescopically with the body 140.

A series of spaced holes 152 are located along the length of the channel 151. The holes 152 are positioned so that when the leg 150 is slid with the body 140, the holes 152 of the leg 50 are aligned with pin 142 located on the body 140. The pin 142 extends through the hollow channels 141 and 151 to locate within a respective hole 152 to fix the channels 141 and 151 with respect to each other.

The foot 160, shown in more detail in FIG. 6, is formed from a plate 161 with two upwardly extending wings 162. A lug 153 is located between the wings 162 and is attached to the end of the leg. A bolt 163 extends through the lug 153 and the wings 162 to pivotally mount the foot 160 to the leg 150.

The brace 130 is the same as described above and formed from a flat strip of metal 131. A linking pin 132 is located at one end of the brace to allow the linking pin 132 to be located with the tab 144 of the body 140. The brace 130 is attached to a stile 12 of the ladder 11 using an appropriate fastener such as a screw, bolt or the like.

In use, the ladder stabiliser 110 is used in a similar manner to that described above. Once the ladder 111 is located in its desired position, the linking pin 132 on the brace 30 is located through the tab 144. The spring biased pin 142 is pulled upwardly to allow the leg to 150 to move telescopically from the body 140 until the foot 160 hits the ground. Once the foot touches the ground, the spring biased pin is released and the leg 150 moved with respect to the body 140 until the spring biased pin engages a hole 152.

FIG. 7 shows an alternate brace 200 that may be used with either of the above embodiments. The brace 200 includes an outer body 210 and an inner body 220. The inner body 220 fits within the outer body and is reciprocatable with respect to the outer body 210. A spring biased pin 230 is located within a hollow shaft 240 that extends upwardly from outer body 250. The pin 230 is biased toward a position where the pin 230 extends into the outer body 210.

The inner body 220 has a series of holes 260 that extend along the inner body 220. The holes 260 are positioned so that when the inner body 220 is slid with the outer body 210, the holes 260 of the inner body 220 are aligned with pin 230 located on the outer body 210. The pin 230 extends through the outer body 210 and inner body 220 to locate within a respective hole 260 to fix the outer body 210 and the inner body 220 with respect to each other.

As with the earlier brace 130, a linking pin 270 is located at one end of the brace 260 to allow the linking pin 132 to be located with the

tab 44 or 144 of the body 40 or 140. The brace 270 is pivotally attached to a stile of the ladder using an appropriate fastener such as a screw, bolt or the like.

The alternate brace 200 enables the arm member to be angled at a variety of different angles with respect to the ladder due to the telescopic nature of the brace 200. Therefore, on ground that is uneven, the ladder stabiliser can provide a greater lateral force if necessary by increasing the angle between the ladder and the ladder stabiliser.

The advantage provided by the ladder stabilisers described above is ease of manufacture, the ease in which it is attached to ladder and the ease in which the ladder stabiliser is positioned for use. Further, the ladder stabilisers can be easily transported whilst still attached to the ladder.

It should be appreciated that various other changes and modifications may be made to the embodiment described without departing from the spirit or scope of the invention.